

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A holographic recording medium in which two-dimensional information pages each having multiple pixels are multiplexed and holographically recorded, wherein:

address pixel and data pixel signals are recorded in each of the two-dimensional information pages;

a plurality of pixels in the two-dimensional information page form the address pixels, and a set of the address pixels forms an address information ~~region; region, the address information region being an integral region;~~

~~the address information region is disposed at a different position in the two-dimensional information page on a two-dimensional information page basis or on a page group basis comprising a plurality of two-dimensional information pages; a position at which a first address information region is disposed on a first two-dimensional information page is different from a position at which a second address information region is disposed on a second two-dimensional information page; and~~

the pixels outside the address information region disposed in the two-dimensional information page form a data region in which two-dimensional information is recorded as the data pixels.

2. (Original) The holographic recording medium according to claim 1, wherein the set of the address pixels and a set of pixels similar to the set of the address pixels in the data region differ from each other in at least either on-pixel ratio or on-pixel arrangement.

3. (Original) The holographic recording medium according to claim 2, wherein

the address information region differs from the data region in on-pixel ratio.

4. (Original) The holographic recording medium according to claim 3, wherein the on-pixel ratio of the data region is set to 50%, and the on-pixel ratio of the address information region is set to less than or more than 50%.

5. (Previously Presented) The holographic recording medium according to claim 3, wherein

the address information region comprises a pixel block including a set of at least nine address pixels, and all the address pixels in the pixel block are set to on or off state.

6. (Currently Amended) The holographic recording medium according to claim 1, claim 23, wherein

the address information regions are disposed at an identical position in an identical page group, and each of the address information regions in the identical page group has a different on or off pixel arrangement in each of the two-dimensional information pages.

7. (Currently Amended) A method for adding address information to a holographic recording medium capable of recording by interference between reference and information beams, wherein,

when recording two-dimensional information pages each comprising multiple pixels into the holographic recording medium, an address information region comprising a set of address pixels formed by a plurality of pixels is formed ~~at a different position in the two-dimensional information page on a two-dimensional page basis or on a page group basis comprising a plurality of two-dimensional information pages, as an integral region, a position at which a first address information region is disposed on a first two-dimensional information page is different from a position at which a second address information region is disposed on a second two-dimensional information page, and two-dimensional information is given to a~~

data region comprising pixels outside the address information region disposed in the two-dimensional information page to perform holographic recording.

8. (Original) The method for adding address information to a holographic recording medium according to claim 7, wherein

address information is holographically recorded such that the set of address pixels and a set of pixels similar to the set of address pixels in the data region differ from each other in at least either on-pixel ratio or on-pixel arrangement.

9. (Original) The method for adding address information to a holographic recording medium according to claim 8, wherein

the on-pixel ratio of the data region is set to 50%, and the on-pixel ratio of the address information region is set to less than or more than 50%.

10. (Previously Presented) The method for adding address information to a holographic recording medium according to claim 8, wherein

the address information region comprises address pixels, and all the address pixels are set as on or off pixels.

11. (Currently Amended) The method for adding address information to a holographic recording medium according to ~~claim 7, claim 24~~, wherein

the address information regions are disposed at an identical position in an identical page group, and the address information regions in the identical page group have different on-pixel arrangements on a two-dimensional information page basis.

12. (Previously Presented) The method for adding address information to a holographic recording medium according to claim 7, wherein

the address pixel and the data pixel forming each of the two-dimensional information pages are displayed by pixels in a spatial light modulator disposed on an optical path of the information beam.

13. (Currently Amended) A method for addressing a holographic recording medium in which: two-dimensional information pages each comprising multiple pixels are multiplexed and holographically recorded by using interference between reference and information beams; an address information region comprising a set of address pixels formed by a plurality of pixels selected from among the pixels and a data region comprising the remaining pixels and capable of recording two-dimensional information are provided in each of the two-dimensional information pages; the address information region being an integral region, and the address information region is disposed at a different position in the two-dimensional information page on a two-dimensional information page basis or on a page group basis comprising a plurality of two-dimensional information pages, and a position at which a first address information region is disposed on a first two-dimensional information page is different from a position at which a second address information region is disposed on a second two-dimensional information page; wherein

a target two-dimensional information page is detected by an amount of light from the address information region among diffraction light generated by irradiating a reference or search beam to the holographic recording medium.

14. (Original) The method for addressing a holographic recording medium according to claim 13, wherein

the data region is recorded with an on-pixel ratio of 50%, the address information region is recorded with an on-pixel ratio of less than or more than 50%, and the address information region is detected by a difference between the amounts of the diffraction light in the data region and the address information region.

15. (Previously Presented) The method for addressing a holographic recording medium according to claim 13, wherein

the reference or search beam is concentrated within the range of the address information region in a target two-dimensional information page, and sequentially illuminates each two-dimensional information page, thereby detecting the target two-dimensional information page by the diffraction light generated when the region illuminated by the reference or search beam matches the address information region.

16. (Currently Amended) The method for addressing a holographic recording medium according to claim 13, wherein

the address information regions are recorded in a form of on-pixel arrangements that differ from one another on a different two-dimensional information ~~page~~~~pages~~, ~~basis or on a two-dimensional information page basis in an identical page group~~, and a target two-dimensional information page is detected according to the on-pixel arrangement after the position of the address information region in the two-dimensional information page has been detected.

17. (Currently Amended) A holographic recording and reproducing apparatus for reproducing two-dimensional information in a holographic recording medium in which: two-dimensional information pages each comprising multiple pixels are multiplexed and holographically recorded; address and data pixel signals are recorded in each of the two-dimensional information pages; a plurality of pixels in the two-dimensional information page form the address pixels, and a set of the address pixels forms an address information ~~region~~, ~~region, the address information region being an integral region, the address information region is disposed at a different position in the two-dimensional information page on a two-dimensional information page basis or on a page group basis comprising a plurality of two-dimensional information pages; a position at which a first address information region is disposed on a first two-dimensional information page is different from a position at which a second address information region is disposed on a second two-dimensional information~~

page; and pixels outside the address information region disposed in the two-dimensional information page form a data region in which the two-dimensional information is recorded as the data pixels, the holographic recording and reproducing apparatus comprising:

 a reference optical system for splitting a laser beam by using a beam splitter into an object beam and a reference beam and irradiating the reference beam to the holographic recording medium;

 a search optical system for irradiating the object beam as a search beam to the holographic recording medium;

 a spatial light modulator provided in an optical path of the search optical system and modulating the object beam to the search beam so as to sequentially illuminate each two-dimensional page;

 a light detector for receiving diffraction light generated from the holographic recording medium by the illumination of the search beam; and

 a control unit for detecting a target two-dimensional information page by an output of the light detector,

 wherein the spatial light modulator comprises multiple pixels capable of describing the two-dimensional information page, and narrows down the object beam to a range corresponding to the pixels of the address information region to modulate to the search beam.

18. (Original) The holographic recording and reproducing apparatus according to claim 17, wherein

 the address information regions in the two-dimensional information pages recorded in the holographic recording medium are recorded in a form of on-pixel ratios that differ from one another on a two-dimensional information page basis or on a two-dimensional information page basis in an identical page group, and the control unit detects the on-pixel

ratio of an address information region from the output of the light detector obtained when the address information region matches the search beam region in the spatial light modulator, thereby detecting a target two-dimensional information page.

19. (Previously Presented) The holographic recording medium according to claim 4, wherein

the address information region comprises a pixel block including a set of at least nine address pixels, and all the address pixels in the pixel block are set to on or off state.

20. (Currently Amended) The holographic recording medium according to ~~claim 2, claim 23~~, wherein

the address information regions are disposed at an identical position in an identical page group, and each of the address information regions in the identical page group has a different on or off pixel arrangement in each of the two-dimensional information pages.

21. (Previously Presented) The method for adding address information to a holographic recording medium according to claim 9, wherein

the address information region comprises address pixels, and all the address pixels are set as on or off pixels.

22. (Previously Presented) The method for addressing a holographic recording medium according to claim 14, wherein

the reference or search beam is concentrated within the range of the address information region in a target two-dimensional information page, and sequentially illuminates each two-dimensional information page, thereby detecting the target two-dimensional information page by the diffraction light generated when the region illuminated by the reference or search beam matches the address information region.

23. (New) A holographic recording medium in which two-dimensional information pages each having multiple pixels are multiplexed and holographically recorded, wherein:

address pixel and data pixel signals are record in each of the two-dimensional information pages;

a plurality of pixels in the two-dimensional information page forms the address pixels, and a set of the address pixels forms an address information region, the address information region being an integral region, the address information region being an integral region;

each of a plurality of page group comprises a plurality of two-dimensional information pages;

a position at which a first address information region is disposed on a two-dimensional information page of a first page group is different from a position at which a second address information region is disposed on a two-dimensional information page of a second page group; and

the pixels outside the address information region disposed in the two-dimensional information page form a data region in which two-dimensional information is recorded as the data pixels.

24. (New) A method for adding address information to a holographic recording medium capable of recording by interference between reference and information beams, wherein,

when recording two-dimensional information pages each comprising multiple pixels into the holographic recording medium, a plurality of page groups each of which comprising a plurality of two-dimensional information pages, an address information region comprising a set of address pixels formed by a plurality of pixels is formed as an integral region, a position at which a first address information region is disposed on a two-dimensional information page of a first page group is different from a position at which a second address information region is disposed on a two-dimensional information page of a second page group,

and two-dimensional information is given to a data region comprising pixels outside the address information region disposed in the two-dimensional information page to perform holographic recording.

25. (New) A method for addressing a holographic recording medium in which: two-dimensional information pages each comprising multiple pixels are multiplexed and holographically recorded by using interference between reference and information beams; a plurality of page groups each of which comprising a plurality of two-dimensional information pages; an address information region comprising a set of address pixels formed by a plurality of pixels selected from among the pixels and a data region comprising the remaining pixels and capable of recording two-dimensional information are provided in each of the two-dimensional information pages; the address information region being an integral region; and a position at which a first address information region is disposed on a two-dimensional information page of a first page group is different from a position at which a second address information region is disposed on a two-dimensional information page of a second page group, wherein

a target two-dimensional information page is detected by an amount of light from the address information region among diffraction light generated by irradiating a reference or search beam to the holographic recording medium.

26. (New) The method for addressing a holographic recording medium according to claim 25, wherein

the address information regions are recorded in a form of on-pixel arrangements that differ from one another on a two-dimensional information page basis in an identical page group, and a target two-dimensional information page is detected according to the on-pixel arrangement after the position of the address information region in the two-dimensional information page has been detected.

27. (New) A holographic recording and reproducing apparatus for reproducing two-dimensional information in a holographic recording medium in which:

two-dimensional information pages each comprising multiple pixels are multiplexed and holographically recorded;

address and data pixel signals are recorded in each of the two-dimensional information pages;

a plurality of pixels in the two-dimensional information page form the address pixels, and a set of the address pixels forms an address information region, the address information region being an integral region;

a plurality of page groups each of which comprising a plurality of two-dimensional information pages;

a position at which a first address information region is disposed on a two-dimensional information page of a first page group is different from a position at which a second address information region is disposed on a two-dimensional information page of a second page group; and

pixels outside the address information region disposed in the two-dimensional information page form a data region in which the two-dimensional information is recorded as the data pixels,

the holographic recording and reproducing apparatus comprising:

a reference optical system for splitting a laser beam by using a beam splitter into an object beam and a reference beam and irradiating the reference beam to the holographic recording medium;

a search optical system for irradiating the object beam as a search beam to the holographic recording medium;

a spatial light modulator provide in an optical path of the search optical system and modulating the object beam to the search beam so as to sequentially illuminate each two-dimensional page;

a light detector for receiving diffraction light generated from the holographic recording medium by the illumination of the search beam; and

a control unit for detecting a target two-dimensional information page by an output of the light detector,

wherein the spatial light modulator comprises multiple pixels capable of describing the two-dimensional information page, and narrows down the object beam to a range corresponding to the pixels of the address information region to modulate to the search beam.